

CLAIMS

1. Liquid electrolyte battery having:
- a casing (1) with side walls (1a, 1b, 1c, 1d), a casing bottom (1e) and a lid,
  - plate-like electrodes (2), arranged pairwise in vertically standing manner in cells,
  - a liquid electrolyte (3), whose level (3a) in the cells extends beyond the upper edge (2a) of the electrodes (2) and
  - a liquid electrolyte circulating device, characterized in that the liquid electrolyte circulating device has the following features:
    - a first plate-like element (4), which is positioned parallel to the electrode plate upper edges or is slightly inwardly inclined in the vicinity of the level (3a) and
    - a vertical flow channel (5) formed between the casing wall (1b, 1d) and the vertical edges (2c) of the electrode plates (2).
2. Liquid electrolyte battery according to claim 1, characterized in that a second plate-like element (6) is placed parallel to the vertical edges (2c) in order to form a flow channel (5).
3. Liquid electrolyte battery according to claim 2, characterized in that the first plate-like element (4) and the second plate-like element (6) are constructed in one piece as angles (4-6).
4. Liquid electrolyte battery according to one of the preceding claims, characterized in that in the vicinity of the upper edge (4a) of the first plate-like element (4) is provided a first return flow preventer (7) for preventing the return flow of a first electrolyte wave.
5. Liquid electrolyte battery according to claim 4, characterized in that the return flow preventer (7) is constructed as a web-like material extension (4b) of the first plate-like element (4).
6. Liquid electrolyte battery according to claim 4, characterized in that the first return flow preventer (7) is constructed as a flap valve (8).

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Sub A3 7. Liquid electrolyte battery according to one of the preceding claims, characterized in that the liquid electrolyte circulating device is placed on both casing sides (1b, 1d).

8. Liquid electrolyte battery according to claim 7, characterized in that the facing liquid electrolyte circulating devices are interconnected.

Sub A4 9. Liquid electrolyte battery according to claims 1 to 6, characterized in that a second return flow preventer (9) with a collecting volume (10) for preventing the return flow of a reflected electrolyte wave is provided.

10. Liquid electrolyte battery having:

- a casing (1) with side walls (1a, 1b, 1c, 1d), a casing bottom (1e) and a lid,
- plate-like electrodes (2) arranged pairwise in vertically standing manner in cells,
- a liquid electrolyte (3), whose level (3a) in the cells extends above the upper edge (2a) of the electrodes (2),
- a liquid electrolyte circulating device, characterized in that the liquid electrolyte circulating device has at least one heating element (12), which is placed on the casing bottom (1e) or close to the latter on side walls (1a, 1c) and which is constructed in such a way as to produce a powerful electrolyte flow on heating.

11. Liquid electrolyte battery according to claim 10, characterized in that the heating element (12) is a wire-wound resistor or a film resistor.

Sub A5 12. Liquid electrolyte battery according to claim 10 or 11, characterized in that the heating element (12) is placed on or in an inner partition of the battery.

13. Liquid electrolyte battery according to one of the claims 10 to 12, characterized in that a plate-like element is provided as a heat protection means between the wall-side heating element and the electrodes (2).

14. Liquid electrolyte battery according to claim 13, characterized in that

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the first plate-like element (4) of the liquid electrolyte circulating device extends into the vicinity of the lower edge (2b) of the electrodes (2) in order to act as a heat protection means.

15. Liquid electrolyte battery having:

- a casing (1) with side walls (1a, 1b, 1c, 1d), a casing bottom (1e) and a lid,
- plate-like electrodes (2) arranged pairwise in vertically standing manner in cells,
- a liquid electrode (3), whose level (3a) in the cells extends above the upper edge (2a) of the electrodes (2),
- a liquid electrolyte circulating device, characterized in that the liquid electrolyte circulating device has at least one cooling element (13), which is located in the vicinity of the electrolyte level.

16. Liquid electrolyte battery according to claim 15, characterized in that the cooling element (13) is a Peltier element.

17. Liquid electrolyte battery according to one of the claims 10 to 16, characterized in that additionally a liquid electrolyte circulating device according to one of the claims 1 to 9 is provided.

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